

We Claim:

1. A process for producing a rice protein concentrate from a rice substrate comprising, a) enzymatically hydrolyzing a rice substrate with i) an enzyme having granular starch hydrolyzing (GSH) activity and ii) a second starch hydrolyzing enzyme at a temperature at or below 72°C and at a pH of about 3.0 to 6.5 for a period of time sufficient for the hydrolysis of a substantial portion of the starch in the rice substrate to obtain a solubilized starch fraction and a residue fraction which includes insoluble protein and b) separating the solubilized starch fraction from the residue to obtain a rice protein 10 concentrate.

2. The process according to claim 1, wherein the enzyme having GSH activity is a glucoamylase.

15 3. The process according to claim 2, wherein the glucoamylase is derived from a strain of *Humicola*, *Rhizopus* or *Aspergillus*.

4. The process according to claim 1, wherein the second starch hydrolyzing enzyme is an alpha-amylase.

20 5. The process according to claim 4, wherein the alpha amylase is derived from a bacterial source.

25 6. The process according to claim 1, wherein the enzyme having GSH activity is obtained from the heterologous expression of a GSH enzyme in a *Trichoderma* strain or an *Aspergillus* strain.

7. The process according to claim 1 further comprising the step purifying the rice protein concentrate.

30 8. The process according to claim 1 further comprising the step of drying the rice protein concentrate.

35 9. The process according to claim 1, wherein the protein content of the rice protein concentrate is at least about 20%.

10. The process according to claim 1, wherein the rice substrate is slurried and has a dry solid content of between 10 to 55%.

11. The process according to claim 1, wherein the temperature is between 70°  
5 and 55°C.

12. The process according to claim 1 further comprising the step of c)  
enzymatically hydrolyzing the rice protein concentrate obtained in step b) with an enzyme  
having GSH activity and a starch hydrolyzing enzyme at a pH of about 3.0 to 6.5 and at a  
10 temperature range of 70° to 55°C to obtain a fraction including solubilized starch and  
insoluble rice protein and d) separating the fractions to obtain a high-purity rice protein  
concentrate.

13. The process according to claim 12 further comprising drying the high-purity  
15 rice protein concentrate obtained in step d).

14. The process according to claim 12, wherein the starch hydrolyzing enzyme  
of step c) is an alpha amylase.

20 15. The process according to claim 12, wherein the protein content of the high-  
purity rice protein concentrate is at least about 60%.

16. The rice protein concentrate obtained according to the process of claim 1 or  
claim 12.

25 17. An animal feed formulation comprising the rice protein concentrate obtained  
according to the process of claim 1 or claim 12.

30 18. A human food formulation comprising the rice protein concentrate obtained  
according to the process of claim 1 or claim 12.

19. A method of increasing the protein content of an animal feed comprising a)  
contacting a rice substrate with a combination of enzymes which include a starch  
hydrolyzing enzyme and a granular starch hydrolyzing (GSH) enzyme at a temperature  
35 below 72°C for a sufficient period of time to hydrolyze 60% of the starch in the rice  
substrate, b) obtaining a solubilized starch fraction and a residue, said residue including

insoluble protein, c) separating the residue to obtain a rice protein concentrate and d) adding the rice protein concentrate to an animal feed.

20. The method according to claim 19, wherein the starch hydrolyzing enzyme  
5 is an alpha amylase.

21. The method according to claim 19 further comprising the steps of contacting  
the residue obtained in step d) with a GSH enzyme and optionally a starch hydrolyzing  
enzyme to obtain a fraction including solubilized starch and a residue comprising insoluble  
10 rice protein, separating the residue to obtain a high-purity rice protein concentrate, and  
adding the high-purity rice protein concentrate to an animal feed.

22. An animal feed comprising the high-purity rice protein concentrate obtained  
according to claim 21.